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(58) Field of search

UK CL (Edition J) B7V VHN
INT CL⁴ B63H

(54) Propellor guard

(57) A propellor guard 10 for use on a marine drive unit 12 of a vessel comprises a cylindrical duct 14 co-axially aligned with the axis of rotation of the propellor of the marine drive unit to extend in a fore and aft direction over the entire width of the propellor and the guard is releasably clamped by plates 20 and screws 22 to the marine drive unit without the need of structural alterations being made to said drive unit. The guard is provided with a rudder fin 50 to improve steering of the vessel at low speed and is also provided with a trim tab 52 to provide lift at the stern of the vessel. The angle of the trim tab is adjustable to enable the planing attitude of the vessel to be adjusted. Transversely extending fin assemblies 32, 42 are provided at the front and rear ends of the duct to restrict access to the propellor.

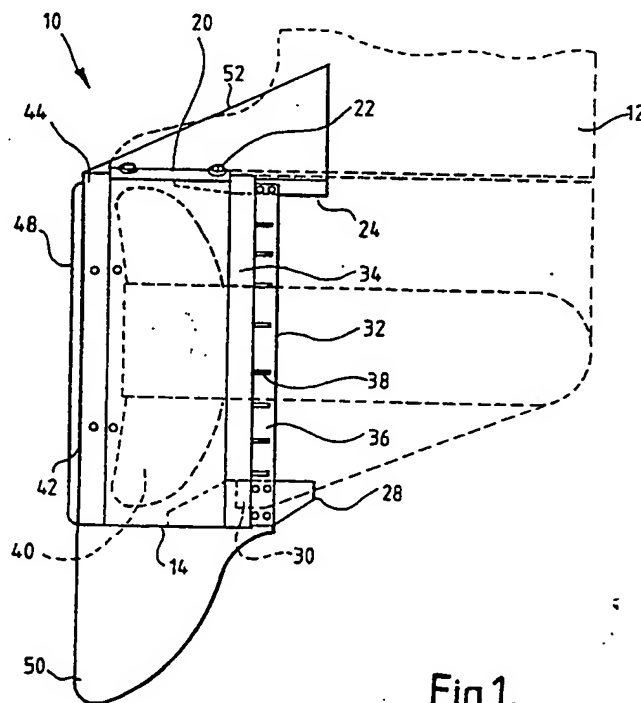


Fig.1.

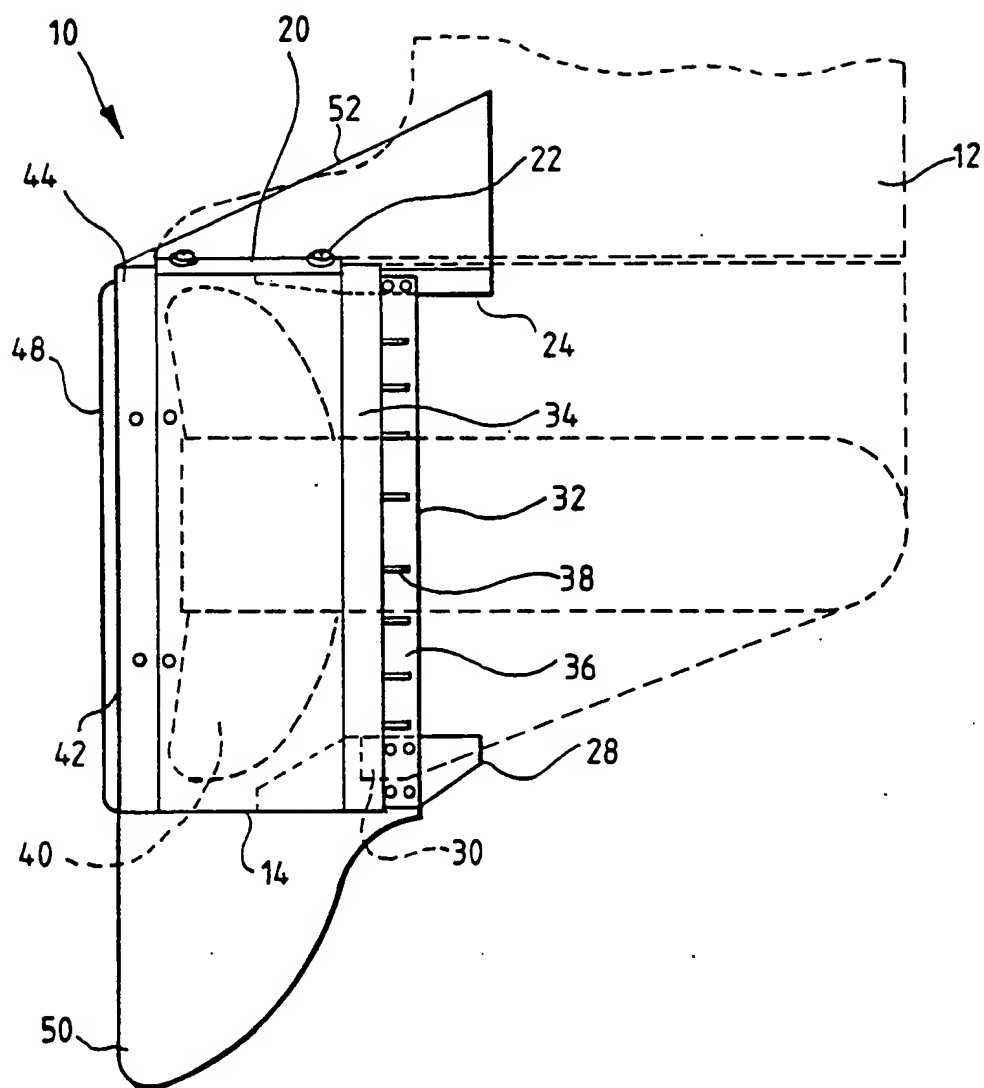


Fig.1.

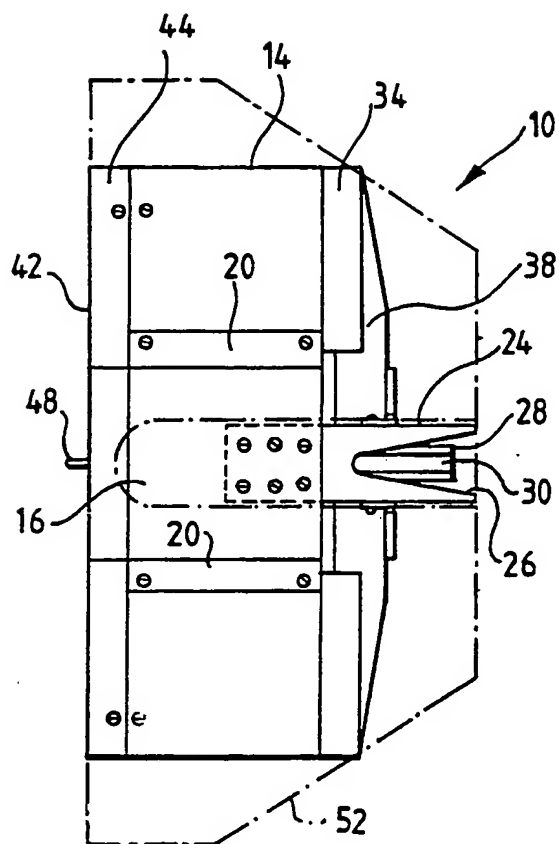


Fig. 2.

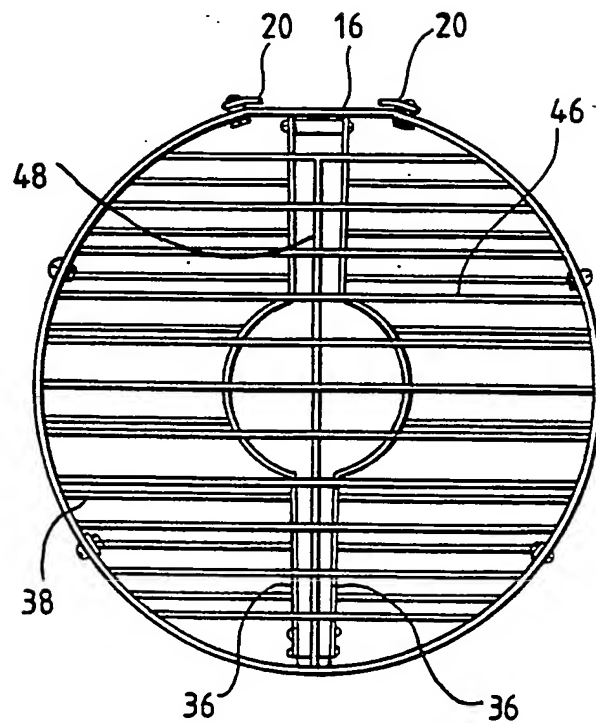


Fig. 3.

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(1)

"An Improved Propellor Guard"

This invention relates to a propellor guard and more particularly, but not exclusively, to a guard for use on marine propellers.

It is found during the operation of marine vessels, particularly in harbours or anchorages that with an unprotected propellor, the propellor of the vessel is often fouled by flotsam such as, for example, discarded ropes, plastic bags, plastic sheets, or the like.

This fouling of the propellor can cause, not only, damage to the propellor drive itself, but also, cause the vessel to be disabled which in confined waters can result in further damage to the vessel itself due to collision or running aground whilst the vessel is "not under command".

Furthermore, once a propellor has become fouled it is often difficult to clear, even when it is part of an outboard engine drive or stern drive which can be raised clear of the water, as the flotsam frequently becomes so tightly wound around the propellor boss that it can not be unwound but has to be cut free with a knife or even a saw.

In addition, the use of an unprotected propellor results in the danger of causing serious injury to any person in the water in the vicinity of the propellor such as, when recovering a person in a "man overboard" situation or when the vessel is being operated in the vicinity of swimmers or divers.

(2)

This risk of causing injury with an unprotected propellor is high when the vessel is being used in the sport of water ski-ing and particularly when recovering skiers from the water.

5 Although propellor guards for the propellers of outboard engines are already known, the fitting of these known guards involves making structural alterations to the outboard engine casings.

 The object of this invention is to provide a
10 propellor guard for a marine propellor which alleviates one or more of the above disadvantages of an unguarded propellor and which does not require structural alterations to be made to the propellor drive unit on which it is mounted.

15 According to one aspect of this invention, a propellor guard for mounting on a marine drive unit of a vessel including an outboard engine, a stern-drive unit or a sail-drive unit comprises a propellor guard assembly adapted to enclose a propellor of the marine drive unit
20 therein, wherein the assembly is provided with clamping means for releasably securing the assembly to the marine drive unit.

 Preferably, the propellor guard assembly comprises a substantially plane cylindrical duct portion which is
25 co-axially aligned with the axis of rotation of the propellor disposed therein.

(3)

Preferably, also, the duct portion extends at least over the entire width of the propellor in a fore and aft direction of the marine drive unit.

The forward end of the duct portion is, preferably,
5 provided with a front fin assembly comprising spaced-apart fins extending transversely of the duct portion between the periphery thereof and associated support members disposed on each side of and substantially conforming in shape to the shape of the marine drive unit casing.

10 Preferably, the rearward end of the duct portion is provided with a rear fin assembly comprising spaced-apart fins extending transversely across the duct portion.

Preferably, also, the front fin assembly and/or the rear fin assembly are releasably secured to the duct
15 portion of the propellor guard assembly.

The clamping means, preferably, comprises two transversely spaced-apart clamping plates for clamping the propellor guard assembly to opposite sides of a cavitation plate of the marine drive unit so that the respective
20 sides of the cavitation plate are each clamped between an associated one of the clamping plates and the adjacent part of the propellor guard assembly.

Preferably, the propellor guard assembly is provided with location means for locating the assembly on a lower
25 portion of the marine drive unit to restrain the assembly against fore and aft movement relatively thereto.

(4)

Preferably, also, a fin is provided to act as a rudder and facilitate steering of the vessel.

A trim tab is, preferably, provided to adjust the planing angle of the vessel.

5 Preferably, adjustment means is provided to adjust the angle of the trim tab.

According to another aspect of this invention, a marine drive unit comprises a unit having a propellor guard according to said one aspect of this invention
10 mounted thereon.

According to a further aspect of this invention, a marine vessel including water borne and air cushion vehicles comprises a vessel having one or more marine drive units according to said other aspect of this
15 invention.

A preferred embodiment of this invention will now be described by way of example only with reference to, and as illustrated by, the accompanying drawings of which:-

Figure 1 is a side elevation of a propellor guard
20 mounted on a marine drive unit;

Figure 2 is a plan view of the propellor guard shown in Figure 1 of the drawings; and

Figure 3 is an end view from the rear of the propellor guard shown in Figure 1 of the drawings.

25 Referring now to the drawings, a propellor guard indicated generally at 10 for mounting on a marine drive

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unit 12 shown in broken lines in Figure 1 such as an outboard engine, a stern-drive unit or a sail-drive unit of a vessel comprises a substantially plane cylindrical duct portion 14.

5 The duct portion 14 is provided with a flat upper section 16 which fits against the lower surface of a cavitation plate 18 of the marine drive unit 12. A clamping plate 20 is secured by clamping screws 22 to the duct portion 14 at each side of the section 16 to
10 releasably clamp the duct portion 14 to the marine drive unit 12 with each side of the cavitation plate 18 located between the associated one of the two clamping plates 20 and the section 16 of the duct portion 14.

 A forwardly extending location block 24 is releasably
15 secured to the forward end of the upper flat section 16 of the duct portion 14 and is provided at the front end with a substantially V-shaped recess 26. The recess 26 is shaped to conform to the shape of the part of the marine drive unit 12 which fits therein, thereby restraining the
20 guard 10 against forward movement relatively thereto.

 A further forwardly extending location block 28 is releasably secured to the front end of the lower part of the duct portion 14 and is provided with a slot 30 in the upper surface thereof. The slot 30 is shaped to conform to
25 and receives therein the lower fin of the marine drive unit 12 thereby restraining the guard 10 against both

(6)

fore and aft movement relatively thereto.

A front fin assembly 32 comprises an outer rim 34, which is bolted to the front of the duct portion 14, two support members 36 conforming in shape to the shape of the drive unit 12 which extend down opposite sides of the drive unit 12 between the location blocks 24 and 28 to which they are bolted, and spaced-apart fins 38 extending transversely between the outer rim 34 and an associated one of the support members 36. The front edges of the fins 38 are at least partially inclined rearwardly to facilitate deflection of foreign bodies away from the duct portion 14 housing a propellor 40 of the drive unit 12 down the outsides thereof.

A rear fin assembly 42 comprises an outer rim 44, which is bolted to the rear of the duct portion 14, spaced-apart fins 46 extending transversely across the rim 44, and a strengthening web 48 connected to the centre of each one of the fins 46.

The lower portion of the duct portion 14 of the guard 10 has a downwardly extending fin 50 secured thereto to act as a rudder and facilitate steering of the vessel at low speeds when the guard 10 is mounted on a marine drive unit 12 of the outboard engine or stern drive unit type.

A trim tab 52 is connected to the upper portion of the duct portion 14 of the guard 10 and is angled to provide lift at the stern of a vessel having a marine

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drive unit 12 of the outboard engine or stern drive unit type to improve the performance thereof. Adjustment means (not shown) is provided to adjust the angle of the trim tab 52 and the adjustment means (not shown) is either
5 manually or power-operated to enable the planing angle of the vessel to be adjusted when under way.

The duct portion 14 of the guard 10 is, when mounted in position on the drive unit 12, co-axial with the axis of rotation of the propellor 40 housed therein and is of a
10 sufficient length to extend over the full width of the propellor 40 in a fore and aft direction.

The enclosing of the propellor 40 by the duct portion 14 of the guard 10 not only prevents contact between objects in the water and the sides of the propellor 40 but
15 also inhibits cavitation effects and reduces turbulence at the propellor blade edges.

The spacing of the fins 38 in the front fin assembly 32 is selected to inhibit the ingress of substantial objects into the propellor 40 which in the case of
20 flotsam could cause fouling of the propellor 40 and consequent damage to the drive unit 12 or disablement of the vessel, and which in the case of persons in the water could cause serious injury.

Similarly, the spacing of the fins 46 in the rear fin
25 assembly 42 is selected to restrict the ingress of objects of flotsam which could occur when the drive unit is

"go-ing astern" and also again provides a guard against injury to persons in the water in the vicinity of the rear of the drive unit 12.

The releasable connection of the rear fin assembly 42
5 to the remainder of the guard 10 allows access to the propellor 40 to, for example, enable it to be replaced, without having to remove the entire guard 10.

The use of connections between the guard 10 and the drive unit 12 which consist of clamping arrangements and
10 location blocks enables the guard 10 to be secured to drive units without having to make any structural alterations, such as drilling holes in the drive unit itself. In addition, the provision of removable location blocks enables the guard 10 to be easily modified to fit
15 different types of drive units whilst still utilising standard components for the major part of the guard.

Furthermore, the fore and aft location of the guard 10 on the drive unit 12 provided by the location blocks 24 and 28 as well as the clamping of the guard to the
20 cavitation plate 18, ensures that any impact loads imposed on the guard 10 due to contact with objects when the drive unit is "go-ing ahead" are borne not only by the cavitation plate but also by the drive unit casing so as not to impose undue stress upon the cavitation plate
25 itself. This ensures that the tilt action of drive units such as outboard engines, which tilt upwardly if an

(9)

obstruction contacts the lower end of the outboard leg is not impaired when the guard is in use.

Where the guard 10 is produced as a metal fabrication or die casting from metals which are not identical to the material from which the drive unit 12 is constructed electrical insulating material or coatings (not shown) are provided between the portions of the guard 10 which are in contact with the drive unit 12 such as, for example, the clamping plates 20, the flat section 16 of the duct, and in the recess and slot of the location blocks 24 and 28. This electrical isolation of the guard 10 from the drive unit 12 is to inhibit galvanic corrosion of the drive unit.

It is also envisaged that the guard 10 could be constructed either in whole or in part of plastics materials by, for example, an injection moulding or similar process which would in itself obviate problems of galvanic corrosion which can occur with the use of dissimilar metals in a salt water environment.

It will be appreciated that additional modifications could be made to the guard without departing from the scope of this invention.

Furthermore, it is considered the guard which is the subject of one aspect of this invention can be used advantageously on the drive units of vessels of all water-borne and water-screw driven air-cushion types.

What I claim is:-

1. A propellor guard for mounting on a marine drive units of a vessel including an outboard engine, a
5 stern-drive unit or a sail-drive unit comprising a propellor guard assembly adapted to enclose a propellor of the marine drive unit therein, wherein the assembly is provided with clamping means for releasably securing the assembly to the marine drive unit.
10
2. A propellor guard according to Claim 1, wherein the propellor guard assembly comprises a substantially plane cylindrical duct portion which is co-axially aligned with the axis of rotation of the propellor disposed therein.
15
3. A propellor guard according to Claim 2, wherein the duct portion extends at least over the entire width of the propellor in a fore and aft direction of the marine drive unit.
20
4. A propellor guard according to Claim 2 or Claim 3, wherein the forward end of the duct portion is provided with a front fin assembly comprising spaced-apart fins extending transversely of the duct portion between the
25 periphery thereof and associated support members disposed on each side of and substantially conforming in shape to

the shape of the marine drive unit casing.

5. A propellor guard according to Claim 2 or Claim 3,
wherein the rearward end of the duct portion is provided
5 with a rear fin assembly comprising spaced-apart fins
extending transversely across the duct portion.

6. A propellor guard according to Claim 4 and Claim 5,
wherein the front fin assembly and/or the rear fin
10 assembly are releasably secured to the duct portion of the
propellor guard assembly.

7. A propellor guard according to any one of the
preceding claims, wherein the clamping means comprises two
15 transversely spaced-apart clamping plates for clamping the
propellor guard assembly to opposite sides of a cavitation
plate of the marine drive unit so that the respective
sides of the cavitation plate are each clamped between an
associated one of the clamping plates and the adjacent
20 part of the propellor guard assembly.

8. A propellor guard according to any one of the
preceding claims, wherein the propellor guard assembly is
provided with location means for locating the assembly on
25 a lower portion of the marine drive unit to restrain the
assembly against fore and aft movement relatively thereto.

(12)

9. A propellor guard according to any one of the preceding claims, wherein a fin is provided to act as a rudder and facilitate steering of the vessel.

5 10. A propellor guard according to any one of the preceding claims, wherein a trim tab is provided to adjust the planing angle of the vessel.

11. A propellor guard according to Claim 10, wherein
10 adjustment means is provided to adjust the angle of the trim tab.

12. A propellor guard constructed, arranged and adapted to operate substantially as hereinbefore described with
15 reference to, and as illustrated by, the accompanying drawings.

13. A marine drive unit comprising a unit having a propellor guard according to any one of Claims 1 to 12
20 mounted thereon.

14. A marine vessel including water-borne and air-cushion vehicles comprising a vessel having one or more marine drive units according to Claim 13.